

**AMENDMENTS TO THE CLAIMS**

1-40 (cancelled)

41. (currently amended) A self-configuring telephone interface unit, comprising:  
a switch matrix, settable to each [[any]] of a plurality of switch configurations, each switch configuration coupling a plurality of signal lines from a handset port of a telephone to a plurality of signal lines from a headset, the plurality of signal lines from the handset port including a handset port receive path, the plurality of signal lines from ~~a handset~~ the headset including a headset receive path; and a control logic, coupled to the switch matrix, that automatically determines which of the plurality of signal lines from the handset port comprise the appropriate signal lines ~~handset port receive path~~, determines a preferred switch configuration from among a plurality of switch configurations based upon which of the plurality of signal lines from the handset port comprise the handset port receive path, and sets the switch matrix to the preferred switch configuration, the preferred switch configuration coupling the handset port receive path, to the headset receive path.
42. (previously presented) The interface unit of claim 41 wherein:  
the switch matrix comprises a plurality of switches, each of the plurality of switches coupling one handset port signal line with one headset signal line;  
each switch configuration in the plurality of switch configurations comprises a predetermined setting for each of the plurality of switches; and,  
the control logic sets the switch matrix to a switch configuration by setting the plurality of switches to the predetermined setting for the switch configuration.
43. (previously presented) The interface unit of claim 42 wherein:  
each of the plurality of switches comprises a FET switch; and  
the control logic comprises an FET gate driver that sets the FET switches.
44. (previously presented) The interface unit of claim 41 wherein:  
the switch matrix comprises a plurality of relays, the plurality of relays coupling the plurality of handset port signal lines to the plurality of headset signal lines;  
each switch configuration in the plurality of switch configurations comprises a

predetermined setting for each of the plurality of relays; and,  
the control logic sets the switch matrix to a switch configuration by setting the plurality of relays to the predetermined setting for the switch configuration.

45. (previously presented) The interface unit of claim 41 wherein:  
the switch matrix is based on a cascading architecture.
46. (currently amended) The interface unit of claim 41 further comprising:  
a signal level detector that generates an output signal, the output signal indicating a level of an input signal to the signal level detector; a detector switch matrix, settable to each [[any]] of a plurality of detector switch configurations, each detector switch configuration coupling the signal level detector input to signal lines from among the plurality of signal lines from the handset port; the control logic further for setting the detector switch matrix to a first detector switch configuration from among the plurality of detector switch configurations; for receiving a first output signal from the signal level detector, the first output signal generated in response to a test signal received by the handset port receive path; and for determining, based on the first output signal from the signal level detector, whether the signal lines coupled by the first detector switch configuration comprise the handset port receive path.
47. (previously presented) The interface unit of claim 46 wherein:  
the test signal comprises a dial tone.
48. (previously presented) The interface unit of claim 46 wherein the signal level detector comprises:  
an AC voltage detector which receives the input signal to the signal level detector; and,  
an A/D converter coupled to the AC voltage detector, the A/D converter generating the output signal of the signal level detector.
49. (previously presented) The interface unit of claim 46 further comprising:  
a variable gain circuit for modifying an amplitude of a signal transmitted on a headset transmit path;  
the plurality of signal lines from the handset port further including a handset port transmit

path; and  
a control logic further for alternately coupling the headset transmit path and a handset transmit path to the handset port transmit path; for setting the detector switch matrix to a detector switch configuration which couples the handset port transmit path to the signal level detector input; for receiving second and third output signals from the signal level detector, the second output signal generated in response to an audio test signal transmitted by the handset transmit path, the third output signal generated in response to the audio test signal transmitted by the headset transmit path; and for adjusting a gain of the variable gain circuit in response to the second and third output signals until a gain of the headset transmit path is substantially equal to a gain of the handset transmit path.

50. (previously presented) The interface unit of claim 41 wherein:

the interface unit further comprises a variable gain circuit for modifying an amplitude of a signal transmitted on a headset transmit path; and, the control logic further automatically adjusts a gain of the variable gain circuit until a gain of the headset transmit path is substantially equal to a gain of a handset transmit path.

51. (currently amended) A self-configuring telephone interface unit, comprising:

a switch matrix, settable to each [[any]] of a plurality of switch configurations, each switch configuration coupling a plurality of signal lines from a handset port of a telephone to a plurality of signal lines from a headset, the plurality of signal lines from the handset port including a handset port receive path, the plurality of signal lines from the ~~handset~~ headset including a headset receive path; a variable gain circuit for modifying an amplitude of a signal transmitted on a headset transmit path switchably coupled to a handset port transmit path; a handset transmit path switchably coupled to the handset port transmit path; and a control logic, coupled to the switch matrix, that automatically sets the switch matrix to a preferred switch configuration from among the plurality of switch configurations, the preferred switch configuration coupling the handset port receive path to the headset receive path through an appropriate signal path; and the control logic couples the handset port transmit path alternately to the headset transmit path and to the handset transmit path; receives a first gain signal and a second gain signal from the handset port transmit path; and adjusts the gain of the variable gain

circuit in response to the first and second gain signals, the first gain signal generated by an audio test signal transmitted by the handset transmit path, the second gain signal generated by the audio test signal transmitted by the headset transmit path.

52. (previously presented) The interface unit of claim 51 further comprising:  
a handset switch for switchably coupling the handset transmit path to the handset port transmit path;  
the plurality of signal lines from the handset port further including the handset port transmit path; and  
the control logic further for switchably coupling the handset transmit path to the handset port transmit path by setting the handset switch.
53. (previously presented) The interface unit of claim 52 wherein:  
the handset switch comprises a FET switch; and  
the control logic comprises a FET gate driver for gating the FET switch.
54. (previously presented) The interface unit of claim 51 wherein:  
the plurality of signal lines from the handset port further includes the handset port transmit path;  
the plurality of signal lines from the headset further includes the headset transmit path;  
and  
the control logic further switchably couples the headset transmit path to the handset port transmit path by setting the switch matrix.
55. (previously presented) The interface unit of claim 51 further comprising:  
a signal generator for generating a signal on the headset receive path, the signal indicating that the audio test signal may be transmitted.
56. (currently amended) A self-configuring headset and telephone interface unit, comprising:  
a headset;  
a switch matrix, settable to each [[any]] of a plurality of switch configurations, each switch configuration coupling a plurality of signal lines from a handset port of a telephone to a plurality of signal lines from [[a]] the headset, the plurality of

signal lines from the handset port including a handset port receive path, the plurality of signal lines from ~~[[a]]~~ the headset including a headset receive path; and, a control logic, coupled to the switch matrix, that automatically determines which of the plurality of signal lines from the handset port comprise the handset port receive path, determines a preferred switch configuration from among the plurality of switch configurations based on which of the plurality of signal lines from the handset port comprise the handset port receive path, and sets the switch matrix to the preferred switch configuration, the preferred switch configuration coupling the handset port receive path to the headset receive path.

57. (currently amended) In a telephone interface unit comprising a switch matrix settable to each ~~[[any]]~~ of a plurality of switch configurations, a method for automatically configuring the telephone interface unit comprising:

- receiving a test signal on a handset port receive path;
- setting the switch matrix to each of at least two switch configurations; for each of the at least two switch configurations, measuring a signal on a ~~[[the]]~~ headset receive path resulting from the test signal; and
- automatically setting the switch matrix to a preferred switch configuration from among the at least two switch configurations, the preferred switch configuration corresponding to the appropriate signal on the headset receive path with either a minimum or a maximum value.

58. (previously presented) The method of claim 57 wherein:

- measuring the signal on the headset receive path comprises measuring a signal level of the signal; and
- the preferred switch configuration corresponds to the signal on the headset receive signal path with a maximum signal level.

59-62 (cancelled)

63. (currently amended) In a telephone interface unit comprising a switch matrix settable to each ~~[[any]]~~ of a plurality of switch configurations for interfacing a handset port of a telephone to a headset, the handset port coupled to the interface unit by a handset port receive path and a handset port transmit path, the headset coupled to

the interface unit by a headset receive path and a headset transmit path, a method for automatically configuring the interface unit comprising:  
receiving a test signal on a handset port receive path; setting the switch matrix to each of at least two switch configurations; for each of the at least two switch configurations, measuring a signal on the headset receive path resulting from the test signal; automatically setting the switch matrix to a preferred switch configuration from the among the at least two switch configurations, the preferred switch configuration corresponding to the appropriate signal on the headset receive path with either a minimum or a maximum value; and automatically adjusting a gain of the headset transmit path to match a gain of the handset port transmit path.